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PROBLEMS FOR SOLUTION.

ALGEBRA.

211. Proposed by **G. W. GREENWOOD, M. A. (Oxon), Lebanon, Ill.**

Prove that $p-qx$ and $q-px$ tend to equality as x dimishes to zero, but yet that their limits are not equal. [Edwards' *Differential Calculus*, p. 7, ex. 10.]

212. Proposed by **F. P. MATZ, Ph. D., Sc. D.**

Solve $\dfrac{x^2+2x+3}{x^2-2x+3}+\dfrac{x^2-2x+3}{x^2+2x+3}=\dfrac{10}{3}$.

213. Proposed by **F. P. MATZ, Ph. D., Sc. D.**

Find the two roots of the equation $x^5-209x+56=0$, whose product is unity.

214. Proposed by **Editor EPSTEEN.**

How many terms are there in the expansion of $(x_1+x_2+\ldots\ldots\ldots+x_n)^n$?

GEOMETRY.

239. Proposed by **W. J. GREENSTREET, A. M., Editor of The Mathematical Gazette, Stroud, England.**

Divide the sides of a triangle ABC internally in P, Q, R, so that $BP/PC=CQ/QA=AR/RB$. QR cuts BC externally in S. Show that BS is to CS in the duplicate ratio of CP to PB.

240. Proposed by **B. F. BURLESON.**

The points P_1, P_2, P_3 in the perpendicular BD of an isosceles triangle with equal angles at A and C are at the intersection of the three perpendiculars of the triangles, the center of its inscribed, and the center of its circumscribed circles, respectively. The distance from P_1 to P_2 is $m=16$ rods, and the distance from P_2 to P_3 is $n=17$ rods. Required the radii R and r of the triangle's circumscribed and inscribed circles, the perpendiculars $BD=P_b$, the base $AC=2b$, and one of the equal sides as $AB=a$.

241. Proposed by **Editor EPSTEEN.**

If two conics have each double contact with a third, their chords of contact with that conic, and two of the lines through their common points, will meet in a point and form a harmonic pencil.

242. Proposed by **the late MARCUS BAKER.**

In a trapezoid $ABCD$, upper base $BC=a$, lower base $AD=b$, a line CP is drawn from vertex C to any point P in the base AD, such that $PD=mb$. The line CP intersects the diagonal BP in M and MN is drawn parallel to the bases meeting CD in N; then is $M.N=\dfrac{abm}{a+bm}$.